

CLAIMS

What is claimed is:

- 1 1. A process for manufacturing a pole tip structure of a magnetic head, comprising:
2 depositing an etch stop layer;
3 depositing a transfer layer;
4 depositing at least one masking layer ;
5 reactive ion etching a trench in at least the transfer layer;
6 depositing a pole tip layer in the trench to define a pole tip structure flanked at
7 least in part by the transfer layer;
8 wherein at least one of an upper surface and a lower surface of at least one of the
9 transfer layer and the etch stop layer remains in co-planar relationship with at least one of
10 an upper surface and a lower surface of the pole tip structure.
- 1 2. The process as recited in claim 1, wherein the etch stop layer includes a non-
2 magnetic material.
- 1 3. The process as recited in claim 1, wherein the etch stop layer includes an
2 insulator.

- 1 4. The process as recited in claim 1, wherein the etch stop layer is deposited utilizing
2 a sputtering operation.
- 1 5. The process as recited in claim 1, wherein a planarization operation is performed
2 on the etch stop layer.
- 1 6. The process as recited in claim 1, wherein the transfer layer includes a material
2 capable of being ion-etched.
- 1 7. The process as recited in claim 1, wherein the masking layer includes photoresist.
- 1 8. The process as recited in claim 1, wherein an adhesion layer is deposited above
2 the transfer layer.
- 1 9. The process as recited in claim 8, wherein the adhesion layer includes a material
2 selected from the group consisting of Si, Ta, Cr, and Ti.
- 1 10. The process as recited in claim 8, wherein a planarization stop layer is deposited
2 above the adhesion layer.
- 1 11. The process as recited in claim 10, wherein the planarization stop layer includes a
2 material selected from the group consisting of C, SiN_x, Ta, and Ti.

- 1 12. The process as recited in claim 10, wherein a planarization operation is performed
2 on the pole tip layer.
- 1 13. The process as recited in claim 1, wherein the pole tip layer includes a
2 ferromagnetic material.
- 1 14. The process as recited in claim 1, wherein the pole tip layer includes a material
2 selected from the group consisting of NiFe and CoFe .
- 1 15. The process as recited in claim 1, wherein the pole tip layer is deposited utilizing
2 ion beam deposition.
- 1 16. The process as recited in claim 1, wherein the pole tip layer is deposited utilizing
2 sputtering.
- 1 17. The process as recited in claim 1, wherein the pole tip layer is deposited utilizing
2 electroplating.
- 1 18. The process as recited in claim 1, wherein an adhesion layer is deposited above
2 the pole tip layer.

- 1 19. The process as recited in claim 18, wherein the adhesion layer includes a material
2 selected from the group consisting of Si, Ta, Cr, and Ti.
- 1 20. The process as recited in claim 18, wherein a planarization stop layer is deposited
2 above the adhesion layer.
- 1 21. The process as recited in claim 20, wherein the planarization stop layer includes a
2 material selected from the group consisting of C, SiN_x, Ta, and Ti.
- 1 22. The process as recited in claim 20, wherein a capping layer is deposited above the
2 planarization stop layer.
- 1 23. The process as recited in claim 22, wherein a planarization operation is performed
2 on the capping layer.
- 1 24. The process as recited in claim 23, wherein the capping layer remains over the
2 pole tip structure after the planarization operation.
- 1 25. The process as recited in claim 24, wherein a reactive ion etching operation is
2 performed to remove the planarization stop layer surrounding the pole tip
3 structure.

- 1 26. The process as recited in claim 25, wherein another planarization operation is
2 performed on a remaining portion of the pole tip layer surrounding the pole tip
3 structure.
- 1 27. The process as recited in claim 26, wherein another reactive ion etching operation
2 is performed on a remaining portion of the planarization stop layer situated above
3 the pole tip structure.
- 1 28. The process as recited in claim 27, wherein a planarization operation is performed
2 on a remaining portion of the pole tip layer situated above the transfer layer.
- 1 29. The process as recited in claim 10, wherein another transfer layer is deposited
2 above the planarization stop layer.
- 1 30. A magnetic head, comprising:
2 an etch stop layer;
3 a transfer layer positioned above the etch stop layer with a trench formed therein;
4 a pole tip layer situated in the trench to define a pole tip structure flanked at least
5 in part by the transfer layer;
6 wherein at least one of an upper surface and a lower surface of at least one of the
7 etch stop layer and the transfer layer remains in co-planar relationship with at least one of
8 an upper surface and a lower surface of the pole tip structure.

1 31. A magnetic head, comprising:
2 an etch stop layer; and
3 a pole situated on top of the etch stop layer;
4 wherein at least one of an upper surface and a lower surface of the etch stop layer
5 remains in co-planar relationship with at least one of an upper surface and a lower surface
6 of the pole.

1 32. A disk drive system, comprising:
2 a magnetic recording disk;
3 a magnetic head including:
4 an etch stop layer, and
5 a pole situated on top of the etch stop layer,
6 wherein at least one of an upper surface and a lower surface of the etch
7 stop layer remains in co-planar relationship with at least one of an upper surface
8 and a lower surface of the pole;
9 an actuator for moving the magnetic head across the magnetic recording disk so
10 the magnetic head may access different regions of the magnetic recording disk; and
11 a controller electrically coupled to the magnetic head.

1 33. A disk drive system, comprising:
2 a magnetic recording disk;
3 a magnetic head including:

4 an etch stop layer,
5 a transfer layer positioned above the etch stop layer with a trench formed
6 therein, and
7 a pole tip layer situated in the trench to define a pole tip structure flanked
8 at least in part by the transfer layer,
9 wherein at least one of an upper surface and a lower surface of at least one
10 of the etch stop layer and the transfer layer remains in co-planar relationship with
11 at least one of an upper surface and a lower surface of the pole tip structure;
12 an actuator for moving the magnetic head across the magnetic recording disk so
13 the magnetic head may access different regions of the magnetic recording disk; and
14 a controller electrically coupled to the magnetic head.